

IN THE CLAIMS:

Claims 1-90 (cancelled)

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Claim 91 (previously amended) A method for producing an information carrier comprising at least two solid material interfaces adapted to contain information and whereat the information is stored by local modulation of at least one solid material characteristic, from which characteristic reflection of electromagnetic radiation depends at said interface, further comprising at least one intermediate layer between said two solid material interfaces, said at least one intermediate layer transmitting said radiation, said information being readable from at least one of said solid material interfaces by means of radiation of predetermined wavelength, the method comprising the step of:

depositing in said intermediate layer at least one layer at least predominantly comprising Si_3N_4 by means of a reactive vacuum coating process, comprising the step of freeing Si from a solid body into a process atmosphere with a reactive gas containing N.

Claim 92 (previously amended) A method for producing an information carrier comprising at least two solid material interfaces adapted to contain information and whereat the information is stored by local modulation of at least one solid

material characteristic, from which characteristic reflection of electro-magnetic radiation depends at said interface, further comprising at least one intermediate layer between said two solid material interfaces, said at least one intermediate layer transmitting said radiation, said information being readable from a least one of said solid material interfaces by means of radiation of predetermined wavelength, the method comprising the step of:

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depositing in said intermediate layer at least one layer at least predominantly comprising $\text{Si}_x\text{N}_y\text{H}_z$ by means of a reactive vacuum coating process in a process atmosphere, an optimum of transmission of said layer and of a refractive index of the material of said layer being achieved by adjusting the concentration of a reactive gas in the process atmosphere, which reactive gas comprises N and H.

Claim 93 (previously added) The method according to claim 92, wherein Si is freed into the process atmosphere from a solid body.

Claim 94 (previously added) The method according to claim 92, wherein said gas in said process atmosphere at least predominantly consists of two different gases with different ratios of at least one of C content to H content and of N content to H content and wherein said optimum is one of open-loop- and of negative-feedback-controlled by adjusting the ratio of amount of said two gases in said process atmosphere.

Claim 95 (previously added) The method according to claim 91 or 92, further comprising applying between a carrier for workpieces, whereon said layer is produced, and an electrode in a vacuum atmosphere a DC-voltage and superimposing to said DC-voltage an AC-voltage.

Claim 96 (previously added) The method according to claim 95, wherein said AC-voltage superimposed to said DC-voltage is a pulsating voltage.

Claim 97 (previously added) The method according to claim 95, wherein said AC-voltage is generated by intermittently connecting said carrier and said electrode via a first current path and a second current path, which second current path having a considerably lower resistance than said first current path.

Claim 98 (previously added) The method according to claim 91 or 92, comprising one of reactive sputtering and of ion plating for said reactive vacuum coating.

Claim 99 (previously added) The method according to claim 98, wherein said sputtering is performed by magnetron sputtering.

Claim 100 (previously added) The method according to claim 91 or 92, wherein a target of negative or positive doped silicon is one of reactively sputtered, ion plated and reactive magnetron sputtered.

Claim 101 (previously added) The method according to claim 91 or 92, wherein the reactive gas is hydronitrogen and is fed to said process atmosphere.

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Claim 102 (previously added) The method according to claim 91 or 92, wherein the reactive gas is Ammonia.

Claim 103 (previously added) The method according to claim 91 or 92, wherein the reactive gas includes Nitrogen.

Claim 104 (previously amended) The method according to claim 91 or 92, wherein said layer is produced as a layer of an intermediate layer between two solid material interfaces of an information carrier, at which interfaces information is adapted to be applied, and whereat the information is stored by local modulation of at least one solid material characteristic, from which characteristic reflection of electromagnetic radiation depends at said interfaces.

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Claim 105 (previously amended) The method according to claim 91 or 92, wherein said layer is produced at an information carrier as an intermediate layer between two solid material interfaces, which intermediate layer comprises a dielectric layer system with at least one layer, at which interfaces information is adapted to be applied and whereat the information is stored by local modulation of at least one solid material characteristic, from which characteristic reflection of electromagnetic radiation depends at said interfaces, wherein said layer system has an optical thickness which, at least in a first approximation, is $m \cdot \lambda_0/4$, wherein m is integer and at least unity and is uneven and wherein λ_0 designated the wavelength of said radiation which is transmitted through said at least one dielectric layer of said dielectric layer system.

Claim 106 (previously added) A method according to claim 91 or 92, wherein the method includes applying a silver layer between one of the solid material interfaces and the intermediate layer.

Claim 107 (previously amended) A method for producing an information carrier comprising at least two solid material interfaces adapted to contain information and whereat the information is stored by local modulation of at least one solid material characteristic, from which characteristic reflection of electromagnetic radiation depends at said interface, further

comprising at least one intermediate layer between said two solid material interfaces, said at least one intermediate layer transmitting said radiation, said information being readable from a least one of said solid material interfaces by means of radiation of predetermined wavelength, the method comprising the step of:

depositing the intermediate layer to have a layer system with at least one dielectric layer and with an optical thickness which, at least in a first approximation, is $m \cdot \lambda_0 / 4$, wherein m is an integer of at least unity and is uneven and wherein λ_0 designates the wavelength of said radiation which is transmitted through said at least one dielectric layer and wherein, depending from said m being an integer, m being reduced by an amount of up to 0.6 or increased by an amount of up to 0.2.

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Claim 108 (previously added) A method according to claim 107, including depositing the intermediate layer so that the electromagnetic radiation for either applying or reading information has a wavelength within the band of $400\text{nm} \leq \lambda_s \leq 800\text{nm}$.

Claim 109 (previously added) A method according to claim 107, wherein at least one of the solid material interfaces is made to have a reflection of from about 20% to about 40% for a selected wavelength of said radiation.

Claim 110 (previously added) A method according to claim 107, wherein said intermediate layer is deposited to have an index of refraction of greater than or equal to 2.59 and less than or equal to 4.6 and an extinction coefficient of less than or equal to 3.0.

Claim 111 (previously added) A method according to claim 107, wherein the dielectric layer at least predominantly consists of at least one of silicon carbide Si_xC_y and of silicon nitride Si_yN_w .

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Claim 112 (previously added) A method according to claim 107, wherein the locally modulated characteristic is the thickness of a solid material body defining at least one of said solid material interfaces.

Claim 113 (previously added) A method according to claim 107, wherein said reflection is valid for a first wavelength at a first of said solid material interfaces and for a second wavelength at the second solid material interface, reflection of radiation of said second wavelength at said first solid material interface being significantly lower than of radiation of said first wavelength.

Claim 114 (previously added) A method according to claim 113, wherein said first wavelength being approximately 635 nm or approximately 650 nm.

Claim 115 (previously added) A method according to claim 113, wherein said intermediate layer comprises at least one dielectric layer having an optical thickness which is an at least approximately uneven multiple of a quarter of one of said first and second wavelengths and is at least approximately an even multiple of a quarter of the other of said first and second wavelengths.

Claim 116 (previously added) A method according to claim 113, wherein said second wavelength is approximately 785 nm.

Claim 117 (previously added) A method according to claim 113, wherein said reflection of said radiation at said second wavelength and at said first solid material interface is 10% at most.

Claim 118 (previously added) A method according to claim 107, wherein at least one is valid:

a) the index of refraction n_1 of said intermediate layer is:
 $2.59 \leq n_1 \leq 4.6$,

b) the extinction coefficient k of said intermediate layer is at least one of: $k_{300 \text{ nm}} \leq 3.0$.

Claim 119 (previously added) A method according to claim 107, wherein said intermediate layer comprises a spacer layer.

Claim 120 (previously added) A method according to claim 119, wherein said spacer layer consists of at least one of a lacquer and of a glue.

Claim 121 (previously added) A method according to claim 107, wherein said dielectric layer consists at least predominantly of at least one of the materials of the group ZrN, HfN, TiN.

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Claim 123 (previously added) A method according to claim 107, wherein one of said solid material interfaces is formed between said intermediate layer and a plastic material or between said intermediate layer and a spacer layer or between said intermediate layer and a high reflecting cover layer.

Claim 124 (previously added) A method according to claim 123, wherein at least one of the following is valid:

said plastic material is one of polycarbonate and of PMMA,

said spacer layer is at least predominantly of at least one of lacquer and glue,

said high reflecting cover layer is at least predominantly of at least one of Al, Au, Ag.

Claim 125 (previously added) A method according to claim 124, wherein said high reflecting cover layer consisting at least predominantly of Al.

Claim 126 (previously added) A method according to claim 107, wherein one of said solid material interfaces is formed at a lacquer surface.

Claim 127 (previously added) A method according to claim 126, wherein said lacquer is hardenable by means of ultra-violet radiation.

Claim 128 (previously added) A method according to claim 107, wherein said intermediate layer comprises at least one semiconductor doping material.

Claim 129 (previously added) A method according to claim 128, wherein said doping material is at least one of Boron and Phosphor.

Claim 130 (previously added) A method according to claim 107, wherein said intermediate layer comprises C and forms at least one of said solid material interfaces with a further material which contains C as well.

Claim 131 (previously added) A method according to claim 107, wherein radiation in the blue spectral range of $400 \leq \lambda_s \leq 500$ nm performs at least one of reading and writing of said information.

Claim 132 (previously added) A method according to claim 107, wherein said intermediate layer comprises at least one of Si_xC_y and of $\text{Si}_x\text{C}_y\text{H}_z$, wherein $x \geq y$.

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Claim 133 (previously added) A method according to claim 107, wherein said intermediate layer comprises at least one of Si_vN_w and $\text{Si}_v\text{N}_w\text{H}_u$, wherein $v \geq w$.

Claim 134 (previously added) A method according to claim 107, wherein said intermediate layer comprises at least one of Si_xC_y and $\text{Si}_x\text{C}_y\text{H}_z$ and wherein $x \geq 1.2y$.

Claim 135 (previously added) A method according to claim 107, wherein said intermediate layer comprises at least one of Si_vN_w and of $\text{Si}_v\text{N}_w\text{H}_u$ and wherein $v \geq 1.2w$.

Claim 136 (previously added) A method according to claim 107, wherein said intermediate layer comprises $\text{Si}_x\text{C}_y\text{H}_z$ and wherein there is valid: $x \leq 0.8$, $y \geq 0.05$ and $z \geq 0.1$.

Claim 137 (previously added) A method according to claim 107, wherein said intermediate layer comprises at least one of $\text{Si}_v\text{N}_w\text{H}_u$ and Si_vN_w and wherein there is valid: $v \leq 0.8$ and $w \geq 0.05$.

Claim 138 (previously added) A method according to claim 107, wherein said intermediate layer comprises at least one of Si_xC_y and $\text{Si}_x\text{C}_y\text{H}_z$ and wherein there is valid: $\{0.445:0.262\} \leq \{x:y\} \leq \{0.775:0.078\}$.

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Claim 139 (previously added) A method according to claim 107, wherein said intermediate layer comprises at least one of Si_xC_y and $\text{Si}_x\text{C}_y\text{H}_z$ and wherein there is valid: $\{0.445:0.249\} \leq \{x:z\} \leq \{0.775:0.118\}$.

Claim 140 (previously added) A method according to claim 107, wherein said intermediate layer comprises at least one of Si_xC_y and $\text{Si}_x\text{C}_y\text{H}_z$ and wherein there is valid: $\{0.078:0.249\} \leq \{y:z\} \leq \{0.262:0.118\}$.

Claim 141 (previously added) A method according to claim 107, wherein said intermediate layer at least predominantly consists of $\text{Si}_x\text{C}_y\text{H}_z$ and wherein there is valid: $x:y:z=0.704 (\pm 10\%):0.087 (\pm 10\%):0.131 (\pm 10\%)$, wherein $\pm 10\%$ indicates the statistic dispersion of multiple measurements of the values.

Claim 142 (previously added) A method according to claim 107, wherein said intermediate layer at least predominantly consists of SixCyHz and wherein there is valid: $x:y:z=0.494 (\pm 10\%):0.238 (\pm 10\%):0.226 (\pm 10\%)$, wherein $\pm 10\%$ indicates the statistic dispersion of multiple measurements of said values.

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Claim 143 (previously added) A method according to claim 107, wherein said intermediate layer comprises at least one of Si_vN_w and $Si_vN_wH_u$ and wherein there is valid: $\{0.527:0.401\} \leq \{v:w\} \leq \{0.858:0.099\}$.

Claim 144 (previously added) A method according to claim 107, wherein said intermediate layer comprises at least one of Si_vN_w and $Si_vN_wH_u$ and wherein there is valid: $\{0.527:0.044\} \leq \{v:u\} \leq \{0.858:0.009\}$.

Claim 145 (previously added) A method according to claim 107, wherein said intermediate layer comprises at least one of Si_vN_w and $Si_vN_wH_u$ and wherein there is valid: $\{0.099:0.044\} \leq \{v:u\} \leq \{0.401:0.009\}$.

Claim 146 (previously added) A method according to claim 107, wherein said intermediate layer comprises at least one of Si_vN_w and $Si_vN_wH_u$ and wherein there is valid: $v:w=0.78 (\pm 10\%):0.11 (\pm 10\%)$, wherein $\pm 10\%$ indicates statistic dispersion of multiple measurements.

Claim 147 (previously added) A method according to claim 107, wherein said intermediate layer comprises at least one of Si_vN_w and $\text{Si}_v\text{N}_w\text{H}_u$ and wherein there is valid: $v:w=0.586 (\pm 10\%):0.364 (\pm 10\%)$, wherein $\pm 10\%$ indicates statistic dispersion of multiple measurements.

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Claim 148 (previously added) A method according to claim 107, wherein at least three of said solid material interfaces are provided on one side of a carrier substrate.

Claim 149 (previously added) A method according to claim 107, wherein an information storage capacity per side of the carrier substrate is at least 11 GByte at a diameter of a circular carrier of 120 mm.
